

CHARACTERISTICS OF RADIO-FREQUENCY CIRCUITS UTILIZING FERROELECTRIC CAPACITORS

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Ferroelectric capacitors, most commonly used in memory circuits and variable components, were studied in simple analog radio-frequency circuits such as the RLC resonator and Colpitts oscillator. The goal was to characterize the RF circuits in terms of frequency of oscillation, gain, etc, using ferroelectric capacitors. Frequencies of oscillation of both circuits were measured and studied—a more accurate resonant frequency can be obtained using the ferroelectric capacitors. Many experiments were conducted and data collected. A model to simulate the experimental results will be developed. Discrepancies in gain and frequency in these RF circuits when conventional capacitors are replaced with ferroelectric ones were studied. These results will enable circuit designers to anticipate the effects of using ferroelectric components in their radio-frequency applications.

Key Word: Ferroelectric; resonator; Colpitts oscillator; RF circuits.